Breast Carcinoma Metastases to the Sphenoid Sinus: a case report

Latifah Al Amer, Abdulrahman Al Khatib, Ghaleb Azzah, Ali Al Momen

Department of ENT, King Fahad Specialist Hospital, Damam, MOH, Saudi Arabia

Corresponding to Ali Al Momen
Department of ENT, King Fahad Specialist Hospital, Damam, MOH, Saudi Arabia

E-mail: alihalmomen@yahoo.com
Mobile No.: 966138442222

Pan Arab Journal of Rhinology
2018, 8:19-20

Breast cancer with paranasal metastasis has been rarely reported. In this paper, we report a case of invasive ductal carcinoma of the left breast metastasizing to the left sphenoid sinus. The metastasize occur after 3 years from receiving neoadjuvant chemotherapy, followed by left modified radical mastectomy with axillary regional lymph node dissection and adjuvant radiotherapy. Computed tomography scan and magnetic resonance imaging of the brain and paranasal sinuses showed enhancing soft tissue lesion occupying the left sphenoid sinus with evidence of bone erosion. The diagnosis was confirmed by endoscopic biopsy that showed the same histological and immunophenotypic characteristics of the primary breast carcinoma.

Keywords: Metastasis, paranasal sinuses, breast carcinoma

Pan Arab Journal of Rhinology 2018, 8:19-20

Introduction

Paranasal carcinoma is uncommon and metastatic carcinoma in this region is very rare. Most frequently metastasis to the paranasal sinuses are from renal cell carcinoma, followed by bronchial cancer, testicular cancer, gastrointestinal cancer and breast cancer. [3] Symptoms and signs of metastatic paranasal sinus carcinoma are unspecific as they may mimic sinusitis, leading to delayed diagnosis, and it could be similar to the symptoms of primary paranasal carcinoma. Until now, the metastatic mechanism is not clear, however, breast cancer spreads by two ways: blood vessels and lymphatic channels. Endoscopic biopsy from the sinus makes the definitive diagnosis. The main treatment of metastasized breast carcinoma to the paranasal sinuses is palliative treatment. So breast carcinoma metastasizes to the paranasal sinuses have poor prognosis with low life expectancy. [6] The present report deals with a case of breast cancer metastatic to the sphenoid sinus.

Case report

In January 2014, a 50 year-old Saudi female was diagnosed as having grade 2, hormone receptor and E-Cadherin positive, HER2 negative invasive ductal carcinoma of the left breast **(Fig. 1)**. The patient received 4 cycles of neoadjuvant chemotherapy, followed by left modified radical mastectomy with axillary regional lymph node dissection performed at King Fahad Specialist Hospital in Dammam-Saudi Arabia. All eleven lymph nodes analyzed were involved as they showed metastatic carcinoma. After surgery, the patient underwent adjuvant radiotherapy, the last session was in March 2015. She is on hormonal therapy since November 2014. The patient's medical history was significant for hypertension and type II diabetes.

In November 2016, the patient experienced a left sided non-specific mild headache associated with mild proptosis. However, there was no history of nasal obstruction, watery nasal discharge, epistaxis, postnasal drip, fever, ear complain or visual defect. A computed tomography (CT) scan and magnetic resonance imaging (MRI) of the brain and paranasal sinuses were requested, and demonstrated an enhancing soft tissue lesion occupying the left sphenoid sinus and bone expansion in the left side of the sphenoid bone with evidence of bone erosion **(Fig. 2)**, and mild proptosis was noted. After that, an endoscopic biopsy of the left sphenoid was taken under general anesthesia. The lesion was highly vascular. After the fixation of the specimen in formalin, it was sent for histopathology and immune-histochemically analysis in our hospital. Upon histological examination, the biopsy showed metastatic carcinoma consistent with the patient's known primary of mammary origin. At immuno-reactivity, the neoplastic cells reacted with cytokeratins, estrogen and progesterone receptors. The sphenoid lesion showed the same histological and immunophenotypic characteristics of the primary breast carcinoma, therefore, the diagnosis of metastatic breast carcinoma to the sphenoid sinus was confirmed.

After the final diagnosis, the patient was referred back to the oncology unit for palliative chemo-radiotherapy.

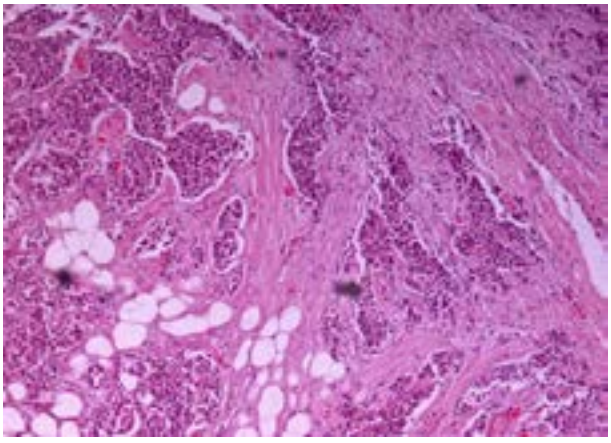

Fig 1

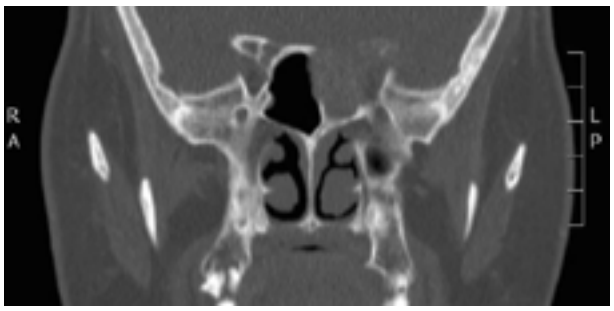

Fig 2

Discussion

Primary carcinoma of paranasal sinuses is rare, accounting for 0.3% of all tumors [1] and 3% of head and neck cancers [2]. Most cancers of the paranasal sinuses occur in the maxillary sinuses, followed by the ethmoid, frontal and lastly in the sphenoid sinus. Moreover, metastatic tumor to the head and neck is uncommon, with exclusively rare metastasis to the paranasal sinuses. The most common tumor that has potential to metastases to the paranasal sinuses is renal cell carcinoma, followed by bronchial cancer testicular cancer, gastrointestinal cancer and breast cancer. [3] Breast cancer metastasis mechanism is not clear until now, but it may spread by two different ways: blood vessels (hematogenous) and lymphatic channels. [4] Although it is rare condition, but breast cancer metastases to head and neck region has been reported. Different sites may be involved, including temporal bone, parotid gland, nasopharynx, larynx, nose and paranasal sinuses. [3]

A metastatic tumor to the paranasal sinuses doesn't have specific symptoms, as it may mimic rhinosinusitis with epistaxis, facial pain and nasal obstruction. [5] Therefore, diagnosis is often difficult and delayed, after having unresponsive patient to rhinosinusitis treatment. In addition, metastasizing cancer to the paranasal sinus may be different to distinguish from primary carcinoma of the nasal cavity. Final diagnosis is usually made by a combination of clinical, radiological, histopathological findings and biopsy. Radiological studies, CT and MRI, will give the surgeon more details about the tumor site, extent and involvement of the soft tissue structures.

There is no definitive curative treatment for these cases. The choices of treatment of a tumor include: surgery, radiotherapy and chemotherapy. But actually surgery has limited role in these cases, as it is used to obtain the biopsy only. On the other hand, radiotherapy and chemotherapy are used for palliative treatment. As Local radiotherapy is used to relief pain, [6] while chemotherapy is used for preventing tumor growth and preserve the organ's function. [7] So the aim of the treatment is to improve or maintain the quality of the life the patients with these cases will have, which is achieved by palliative therapy. However, when breast carcinoma metastasizes to the paranasal sinuses it is considered a very bad and poor prognosis. [6] By reviewing the literature, most of the patients with metastasized breast cancer to the paranasal sinuses died few months after the diagnosis. [7] With interval between the diagnosis of breast carcinoma and paranasal metastasis ranging from 3 months up to 12 years [3]. In our case, metastasize occurred after 3 years of being diagnosed with breast carcinoma.

Conclusion

To conclude, we want to highlight that even though the metastasis of breast carcinoma to the paranasal sinuses is rare it may occur. Therefore, the differential diagnosis of patients presenting with symptoms of sinusitis should include metastasis.

Financial support and sponsorship

Nil

Conflicts of interest

There are no conflicts of interest

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